SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1421.—Vol. XXXII.] LONDON, SATURDAY, NOVEMBER 15, 1862. [WITH JOURNAL] STAMPED.... SIXPENCE. UNSTAMPED. FIVEPENCE.

Published at the Mining Journal *office*, 26, *Fleet-street, London.*

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THE TREGURTHA DOWNS AND OWEN VEAN CONSOLS MINING COMPANY (LIMITED).

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ABRIDGED PROSPECTUS.

The company (incorporated under the Companies Act, 1862, with limited liability), formed to work the Tregurtha Downs and Owen Vean Tin and Copper Mines, which are situated in the heart of one of the richest mining districts in Cornwall, being in the parishes of St. Hilary and Perranuthnoe, and surrounded by some of the most productive mines in the county.

Tregurtha Downs Mine was wrought many years ago, and, although it was opened upon a shallow level, and to a very limited extent, it, nevertheless, yielded a profit to the adventurers; but, from the insufficiency of the machinery as the mine was deepened, and from the low prices at which metals and ores then ranged, the working was discontinued. During this time, however, a large amount of valuable work was rendered available for a new company; and, by these and previous operations, the tedious and costly dead work, which must necessarily be done on first opening any mine (and which would require at least three years to accomplish), is already effected, and the mine is thus already opened, so as to become productive as soon as the respective levels can be set.

The sett is large, extending for nearly a mile in length on the course of the lodes, and of the same in breadth. Several productive lodes of fine tin, three of copper, and one rich lode of silver-lead have been opened upon. Three of the principal tin lodes form a junction eastward, and at this point of intersection there is no doubt but that large deposits of mineral will be met with. There are several other lodes which have been wrought at all, but which present excellent indications, and the sett is intersected by elvans and cross-courses, which are always largely productive of mineral at the intersections of the lodes.

The mine is situated in killas, near to its junction with the granite—a stratum essential for the production of mineral, and of the easiest and cheapest description for sinking and driving.

The workings hitherto have been very shallow, the greatest depth to which the engine-shaft has been sunk being only 60 fms., at which level the richness of the lodes is found to be increasing. This depth—viz., 60 fms.—is trifling compared with that of the neighbouring mines by which Tregurtha Downs is surrounded, and which have been so productive—viz., Wheal Fortune, 152 fms.; Enys Wheal Virgin, Wheal Prosper and Wheal Darlington, 120 fms. each; Wheal Virgin, 115 fms.; Penbertney Crofts, 110 fms. To those who are conversant with mining it is unnecessary to say that many of the best mines only just began to be productive at 50 or 60 fms. in depth, and that by far the largest returns have been made from much greater depths.

The upper levels hitherto opened in Tregurtha Downs Mine have not yet been extended over the productive ground, little having been done below 35 fms. on engine-shaft or below 37 fms. on flat-rod lode. And when deeper levels are brought in, immense quantities of tinstuff may be raised, which, at the present high price of tin, would pay very large profits. The copper ore is very rich, some of it having been sold at from £10 to £30 per ton.

Owen Vean Mine is in the parishes of Perranuthnoe and St. Hilary, and immediately adjoins Tregurtha Downs on the west, the same lodes running through both setts, and into Wheal Trevelyan, where they are now yielding rich courses of ore. The deepest point reached in flat-rod shaft is 70 fms., but very little has been done under the 50 fm. level, and although the workings have been so limited this mine has returned £250,000 worth of copper ore, besides large values of tin, and was discontinued working about 20 years ago, chiefly through the low values of copper and tin then ruling, and partly through the engine having been placed in a bad position. Capt. B. Gundry, who was the underground agent, reports that there is a rich lode of copper ore now standing in the 40 and 50 fm. levels, which would readily be set at 3s. in £1 tribute, and that the ground lying between this and Tregurtha Downs, with the grey ore running into it, gives a most excellent prospect. Park shaft is sunk to a depth of only 40 fathoms below the deep adit, where there is a very large lode, with courses of copper ore worth from £18 to £20 per ton. There are also parallel lodes north and south, which have never been wrought at all, but which may be reached by cross-cuts to very great advantage.

The productiveness of the district in which Tregurtha Downs and Owen Vean are situated will be seen from the returns of copper ore yielded by several of the surrounding mines, at some of their more recent workings only, as noted on the respective setts in the map, and of which the following are the most important:—

Mines.	Returns.	Mines.	Returns.
Wheal Fortune	£370,000	Rodney Mines	£31,000
Old Wheal Neptune	400,000	Wheal Trevelyan	20,000
Wheal Friendship	261,000	Gwallon	61,000
Halamanning	283,000	Wheal Caroline	84,000
Owen Vean	250,000	Tolvadden	48,000
Tregurtha Downs	165,000	Trenow Consols	48,000
Marazion Mines	161,000	Trebarvah	32,000
Wheal Charlotte	151,000	Wheal Grylls	47,000
Wheal Darlington	119,000	St. Aubyn and Grylls	65,000
Wheal Jewell	108,000	Wellington, now part of Wheal Grylls	32,000
Wheal Speedwell	167,000		
Guskus	23,000		

The above returns have been extracted from the records preserved in the Museum of Practical Geology, and from other sources. The aggregate of these figures amount to nearly £3,000,000 sterling; and if to this be added the copper produced by the same mines at their earlier and other workings, and by those of the surrounding mines, of which there are no official returns, the total will probably amount to nearly, if not quite, £5,000,000 sterling. For Great Wheal Fortune was worked previously by the ancestors of Sir Charles Lemon, and is said to have given them £300,000 profit, and made the fortune of that family. Wheal Neptune is estimated to have yielded altogether £400,000, and the Marazion Mines, Penberthey Croft, Gwallon, Tregurtha Downs, Owen Vean, Wheal Trevelyan, &c., were all worked previously, and yielded large profits.

There are no official returns of the tin obtained from any of the above mines, but as the district is even richer for tin than for copper, the value of the latter metal returned by them has probably exceeded that of the copper ore which they have produced, forming an immense aggregate of mineral yielded by the immediate district, and which, at the present value of the respective ores, would probably not be over estimated at from £8,000,000 to £10,000,000 sterling.

Several of the surrounding mines are now in full operation, and are making large returns, as Tolvadden, Wheal Charlotte, Wheal Anna, Wheal Grylls, West Wheal Trevelyan, &c.; while the favourable estimate in which the district is held is evinced by the fact that others have been recently put to work again—viz., Wheal Virgin, Gurlyn, and Old Wheal Neptune; and a powerful company has been formed to work the adjoining setts, Wheal Prosper, West Prosper, and East Rodney, jointly with Trevarthian Downs, of which Mr. J. Y. Watson says, in his last "Annual Review of the Progress of Mining" (p. 29), "they have thus far even exceeded the great expectations formed of them at starting." It will be seen by the map that these mines immediately adjoin Tregurtha Downs, and they are now in rich courses of ore, having already sold tin and copper producing £2832 9s. 9d.; in addition to which the tin at surface and in course of stamping and dressing is valued at £2237.

Very careful estimates have been made of the amount of capital required to furnish all the machinery, plant, &c., requisite for putting Tregurtha Downs and Owen Vean Mines to work efficiently, and to bring them into a condition to yield a regular profit to the adventurers. These estimates range from £17,500 to £25,000, according as the mines may yield ores more or less abundantly while being drained; but in order to provide for all possible contingencies, and to ensure a full and advantageous development of the property, the total capital has been fixed at £40,000, in 16,000 shares of £2 10s. each, of which, however, it is not expected that more than from £1 10s. to £2 will ever be required.

The accompanying reports from agents of high respectability and of great experience, who are well acquainted both with the mines themselves and with the district in which they are situate, and from practical miners who have worked in the setts, together with the returns of ore yielded, present unusually copious and conclusive evidence of the mineral richness of the properties themselves, and of the surrounding district, and give a just and well-founded confidence that the investment will prove highly remunerative, while the extent to which the mines are already opened insures immediate and increasing returns; for, whilst the workings are being drained, a great many tributers may be employed on the stopes in the different levels, and large quantities of tin and copper ore may be at once raised, which will assist in meeting the cost of laying the mines open for extensive workings, so as to yield a large profit to the shareholders at an early period.

The dues are exceedingly moderate, being only 1-20th of all the minerals raised.

The liability of the shareholders is strictly limited to the amount of their shares.

Applications for shares may be sent in the accompanying form, but no application will be considered unless a deposit of 5s. on each share applied for is made, for which a receipt will be given, to be afterwards exchanged for share certificates. The deposit may be paid at the company's bankers in London, Helston, or Penzance, if by hand; but applications from the country or by post should be sent to the brokers or managers. Should the directors allot less than the number of shares applied for, the balance of deposit will be appropriated towards the stipulated payment of 15s. per share on allotment, or, should the application not be acceded to, the deposit will be immediately returned without deduction.

Prospectuses, forms of application, and all desired information may be obtained of the brokers or managers, where also may be seen a copy of the Articles of Association, and plans and sections showing the workings, copied from the originals in the Museum of Practical Geology, Jermyn-street.

REPORTS ON TREGURTHA DOWNS AND OWEN VEAN MINES.

In compliance with your request, we have this day inspected the surface of Tregurtha Downs Mines, in the parish of St. Hilary. The sett is very extensive, and is situated in a good mining district. Several lodes are known to pass through its entire length, intersected by cross lodes and elvan courses, which are favourable indications for the production of minerals. Two or three of these lodes have been partially wrought to the depth (as we were informed) of about 60 fms. from surface, and from which large quantities of tin and copper ores have been returned. We do not hesitate to recommend this mine to any party inclined to speculate, believing it to be a valuable property.

WILLIAM ROBERTS, JOHN DAW,
Managers of West Basset, Carn Brea, and Great South Tolgus Mines.

Agreeably to your request, I have this day inspected Tregurtha Downs Mine. The rock in which the lodes occur is clay-slate, and the lodes are composed of gossan, soft friable quartz, chlorite green, blue carbonate of copper, and the red and green oxide and sulphuret of copper, with a little tin ore, and a large elvan course riding on one of the lodes, with a silver-lead lode running north and south. These details correspond in every respect with those which exist at the rich Tolvadden Mine, which is situated to the south-west and joins this mine. The nature of the lodes at the bottom of the mine is proved by the beautiful matrix brought up just before the mine was stopped, and now lying on the surface. I have the greatest confidence in recommending this property as one of the best in the county for exploration, and if it does not remunerate capitalists for their outlay it will be a freak in Nature's laws.

WILLIAM BISHOP, Manager of Lewis Mines.

I believe if this mine is properly worked large quantities of tin and copper will be returned, and good profits paid to the shareholders. There are two or three side lodes wholly unwrought to the south of the above lode, presenting good indications for the production of mineral, and, no doubt, will be found a great auxiliary to the mine.

JOHN VERCOE, Manager of Wheal Jane (but worked at tribute in Tregurtha Downs).

I was employed as a labourer in the mine when it was last worked, and from what I have there seen from old miners who worked there, I believe it to be one of the most valuable setts now idle in the neighbourhood. From the large quantities of tin sold there, at a time when tin was about 45*l.* per ton, I have no doubt large monthly returns of tin will be made, even from the numerous old stulls alone, when the mine is drained to bottom. I should recommend a steam pumping-engine, whim, and stamps to be erected at once, and if the operations are carried on with vigour I have no doubt of Tregurtha Downs becoming a good and lasting concern.

JOHN CURTIS, Manager of St. Aubyn and Grylls.

This mine is wrought by the Marazion Mining Company about 25 or 30 years ago, principally for copper ores, but, on the suspension of these mines, a large quantity of tin was found, amounting, I have heard, to some thousand pounds in value, tin at this period being very low—about £38 or £40 per ton. I consider this sett a good speculation, and would recommend not less than a 70-in. cylinder engine being erected on the old sump, which would command the copper and tin lodes.

A. BENNETT, Manager of Tolvadden Mine.

The situation of the sett, which is very extensive, cannot be surpassed; it is almost surrounded by mines that have yielded an abundance of mineral in copper and tin ores, with proportionate profits to the adventurers. It contains elvan courses and cross-courses, with the other concomitants so essential to profitable mining. Tregurtha north lode is Gear's lode to the east; the lode is to the north of the elvan course, and underlies south, the elvan course underlies north; therefore the lode passes through it, a most favourable circumstance. The engine-shaft sunk by the last workers is on a south lode, to the depth of 37 fms., under an adit of 12 fms. from surface; this lode produced a large quantity of rich tin and copper ore. With a capital of (say) £20,000, a large engine and pitwork for draining the mine of water, you will make a profitable concern.

STEPHEN OSBORNE, late Agent at Wheal Grylls.

I have surveyed the surface of Tregurtha Downs sett, and from its situation and the congenial strata of ground, with a large elvan course passing through it, I fully believe that the lodes when explored will prove very productive; and, with the capital named, I have no doubt a good mine would be obtained, with good profits to the adventurers.

WILLIAM OATS, late Agent at Great Wheal Vor.

I worked in Tregurtha Downs Mine for several months on the south lode, within 15 fms. of Bray's shaft, in the bottom of the 27. I and five other men broke in one month 645 barrows of tinstuff, drawing it all up a winze, and spalling it out in order for sampling, which brought 10s. per barrow, at £36 per ton. I opened good tribute ground in that part of the mine, which turned out large quantities of tinstuff.

STEPHEN OSBORNE, Jun., Wheal Grylls.

These mines are situated in the parish of St. Hilary. The setts are very extensive, containing several parallel lodes, composed of copper, tin, and silver-lead, of a superior quality, and there is every indication of their proving as lasting as they are a valuable property. I have carefully gone over the entire area, and on one occasion accompanied Evan Hopkins, Esq., the eminent geologist, who stated in my presence, that if ever there was a good mine in Cornwall, this was sure to be." This opinion I am able, from my own knowledge, to confirm to the fullest extent; I have also ascertained, from undoubted authority, that large sums have been realised from the ores returned from the burrows and halvans. If these mines are put into a full and efficient state of working, there can be no possible doubt that they will at once prove most remunerative; in fact, that immense profits will result to the shareholders.

JOHN ROBERTS,
Late Agent in Wheal Mary.

In accordance with your request, I now beg to submit to you the result of my investigation of the Tregurtha Downs Consolidated Mines, and in doing so to state that the favourable character I had previously heard of them is fully borne out by facts. The sett is very extensive; it consists of several productive lodes of fine tin, three of copper, and also a rich one of silver-lead. Three of the principal tin lodes form a junction eastward near the water stile shaft, and at this point an immense body of mineral of a valuable kind exists. The workings are here down only 30 fms., and the certainty of large results being obtained from this point of intersection is beyond all doubt. There are also a number of other lodes not yet proved. I find that the workings hitherto have been of a very limited kind. The greatest depth of shaft yet attained is 60 fms., at which level the richness of the lodes increases. The mines are traversed by an elvan course, against which lodes are invariably productive, as well as by the lead lode before alluded to. From these circumstances, it is my conviction that, by the judicious employment of adequate means, a future company could not fail in realising immense returns upon their investment. I should recommend the erection of an engine of 70-in. cylinder, and 18-in. pumps, with proper gear, &c.; this would be sufficient for the working of the mines to a depth of 150 fms. below adit. A steam-stamps of considerable power should also be provided, as immediately on the engine commencing working large quantities of tinstuff will be raised, and a crusher for the copper would likewise be required. For these purposes, and for fully developing and working these valuable mines, I should recommend a capital of £20,000, but as they would return ores at a very early period, I do not think it would be necessary to call the whole amount up. In conclusion, I must say that in my experience, which is considerable, I have never met with a more promising mineral property than this is; and I do not hesitate to repeat that, if efficiently worked, it must speedily make one of the richest and most durable mines in the county.

JAMES THOMAS, late Agent of Halamanning Mines.

In submitting to you my report of the Tregurtha Downs Consolidated Mines, allow me to say that I fully agree in every particular with Capt. James Thomas as to the highly favourable character of the sett. Looking at the number and extent of the above lodes, also to that of silver-lead of a rich quality, and the great facilities that exist for working these mines, I can assert, without hesitation, that the prospects of immediate as well as permanent large profits are of a nature seldom to be met with, and that it is my conviction, that with proper management they will not be surpassed by any in the county, and that I would confidently recommend them to the notice of anyone seeking a safe and lucrative investment.

PETER FLOYD, late of Tincroft Mines.

In handing you my report of the Tregurtha Downs Consolidated Mines, I beg to say I have very rarely, if ever, seen an opening for capital investment with such good prospects, in my practice of nearly 30 years as a mine agent. I have, within the last four months, visited these mines not less than ten times, and every visit strengthens my opinion. I consider it to be a most valuable property.

JOHN VIVIAN, late Manager of Halamanning Mines.

I worked in Tregurtha Downs on the copper lode near Bray's shaft, on a tribute pitch. The next month my comrades cut the lode rich in copper ore, and got, I think, about £70 each man in one month. I should think, at the present standard, this ore would be worth from £25 to £30 per ton. I know several lodes east of Tregurtha Downs, promising lodes, which must go through Tregurtha Downs sett, and on falling in with the elvan course they are likely to produce both tin and copper. From the reports I have heard for many years, from men I could put the utmost confidence in, and from what I know of the lodes and the locality, I think it to be the best sett in the neighbourhood.

B. GUNDRY, late manager of Wheal Charlotte.

I was shaftman in Tregurtha Downs about 12 months. The engine-shaft fell in with the south lode between the 50 and 60. The 60 is the bottom or deepest place; the lode here is large, but scarcely any ground opened on it, at this level east or west of the engine-shaft. The deeper levels are not extended under the productive ground; there are several lodes and branches which run through the elvan course, producing large quantities of tinstuff. The workings being so shallow, if the deeper levels were brought in, immense quantities of tinstuff might be raised, which, at the present price of tin, would pay considerable profits. If the western part of the mine were cleared out, and the levels driven east to water stile shaft, I consider that it would make as good a tin mine as any in the district.

JAMES FLOYD.

Owen Vean Mine is situated in the parishes of Perranuthnoe and St. Hilary. There is a rich lode of grey ore now standing in the 40 and 50 fm. levels, west of Pearce's shaft, which would easily set at 3s. in £1 tribute, if the levels were extended in that direction to drain the ground; and this lode runs directly into Tregurtha Downs. There are parallel lodes north and south never yet proved, which I have seen opened on from surface, and which might be cut by a cross-cut from Owen Vean to a very great advantage. Owen Vean lode, being one of the great leading lodes of district, deserves a trial at a greater depth; and the ground lying between this sett and Tregurtha Downs, with the grey ore lode running into it, gives a most excellent prospect for any company who may work those mines. What I have here stated is from my personal knowledge and experience, having been underground agent in the last working of the mine from its commencement to within a few months of its suspension.

BENJAMIN GUNDRY.

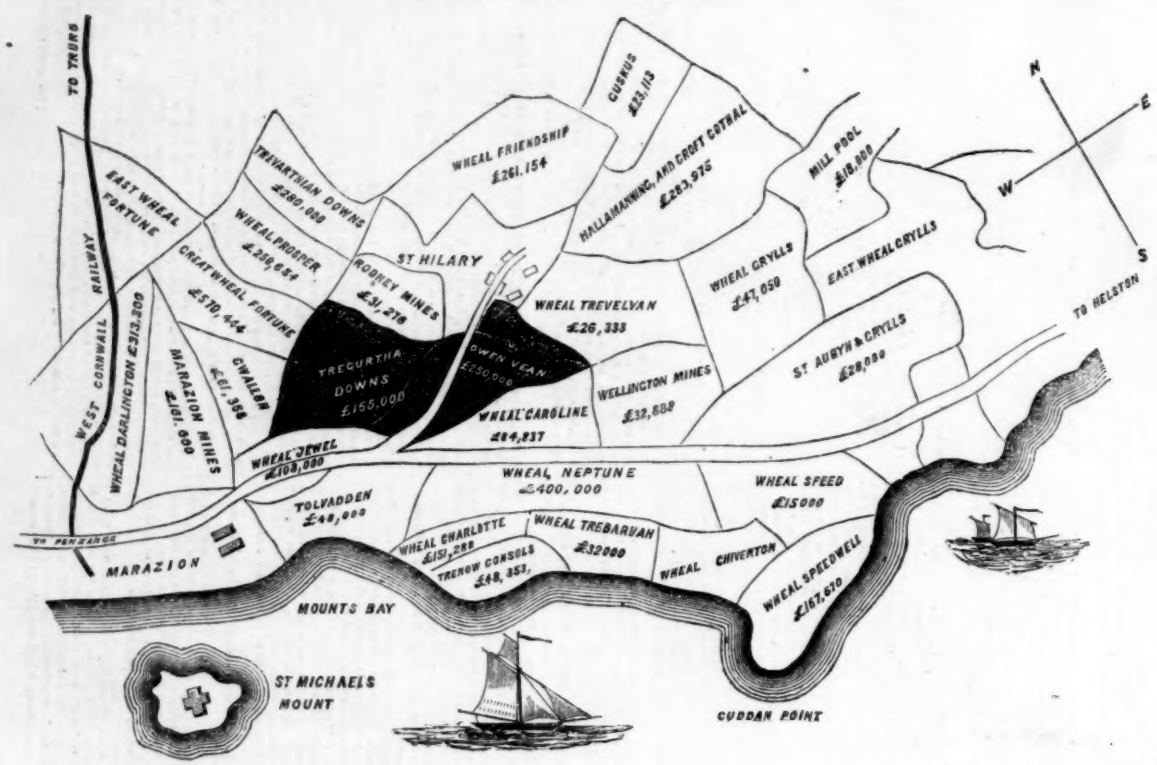
Having worked as a tributer for several years in Owen Vean, from the 30 fm. level and upwards, I desire to inform you Park shaft is sunk to the depth of 40 fms. below the deep adit, where there is a very large lode, with courses of copper ore, worth from £18 to £20 per ton. Tribute pitches were generally worked at from 5s. to 8s. in £1. Several lodes are known to pass through the entire length of the sett, and which have not been seen below the shallow adit; and, from what I have heard from old and practical miners, coupled with my own observation and judgment, I have great confidence in recommending Owen Vean as a valuable property. I believe if this mine is properly worked large quantities of copper ore will be returned, and large profits accrue to the shareholders. This sett is situate in a good mining district.

WILLIAM BAWDEN.

[*For continuation, turn over.*

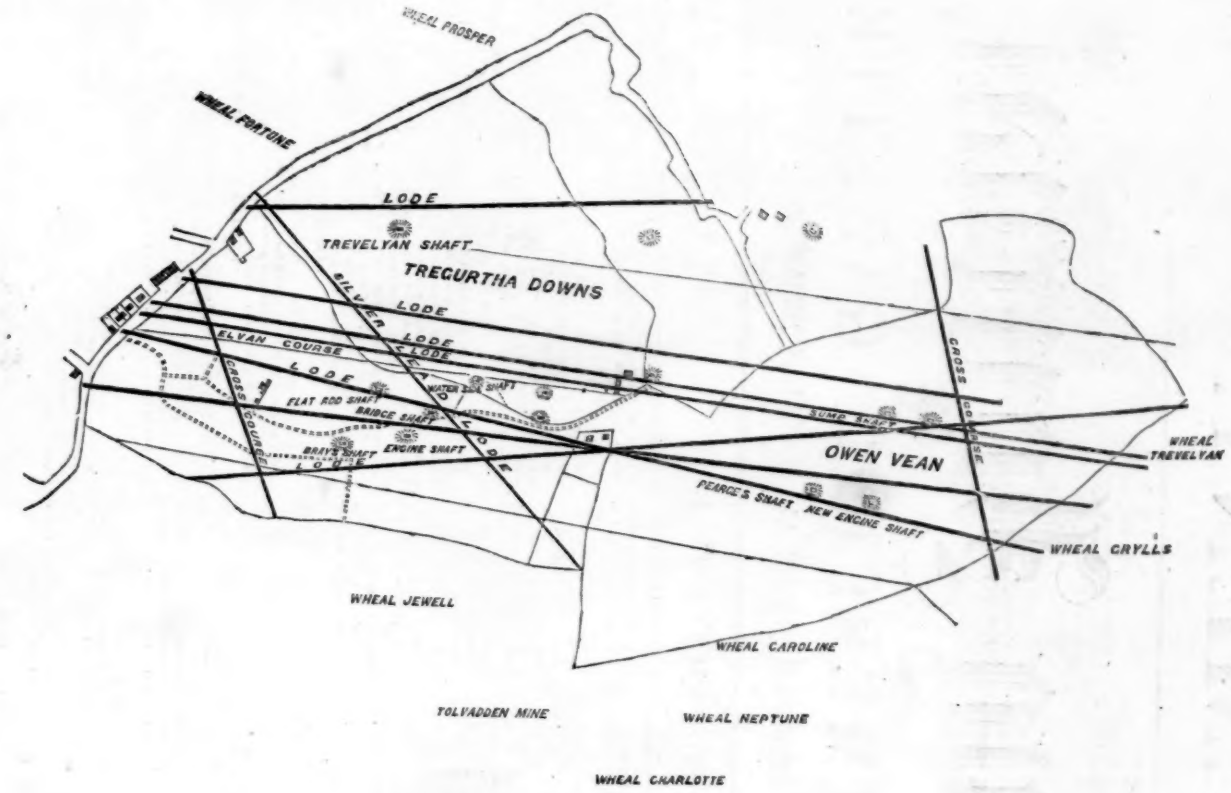
MAP OF THE TREGURTHA DOWNS AND OWEN VEAN DISTRICT,

Showing the neighbouring Mines, and the returns of Copper Ore at their more recent workings. There are no returns of the Tin yielded by them, nor of Copper Ore at their earlier workings. These figures, therefore, show but a part of their actual produce.



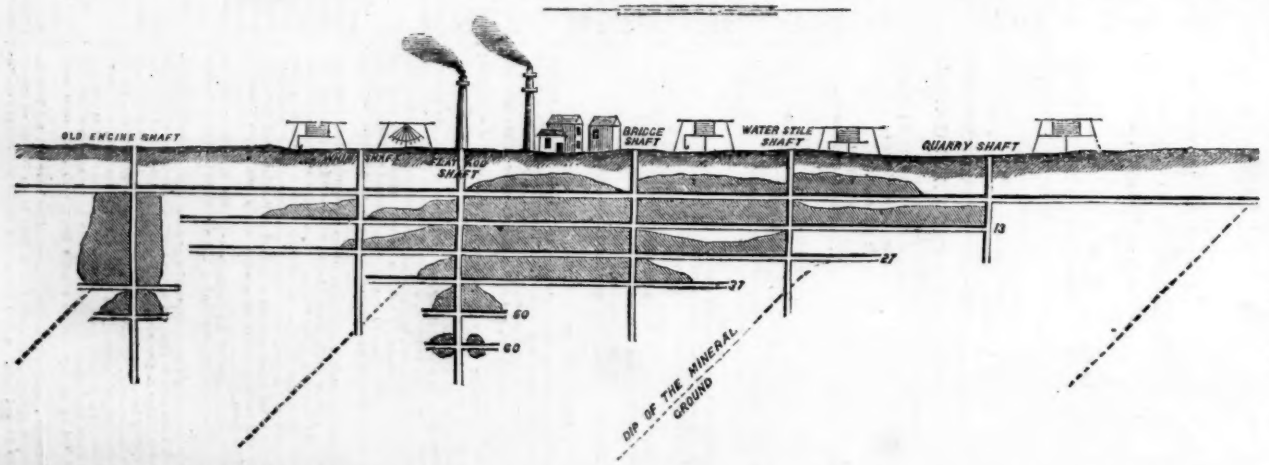
GROUND PLAN OF TREGURTHA DOWNS AND OWEN VEAN MINES,

Showing the Lodes, Elvan Course, and Cross Courses.

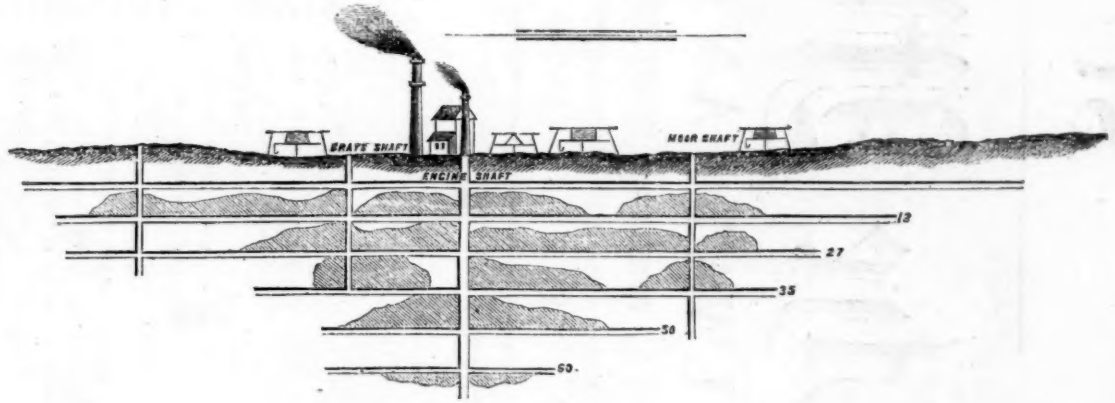


TREGURTHA DOWNS MINE:—

Section of the Workings on Flat Rod Lode.

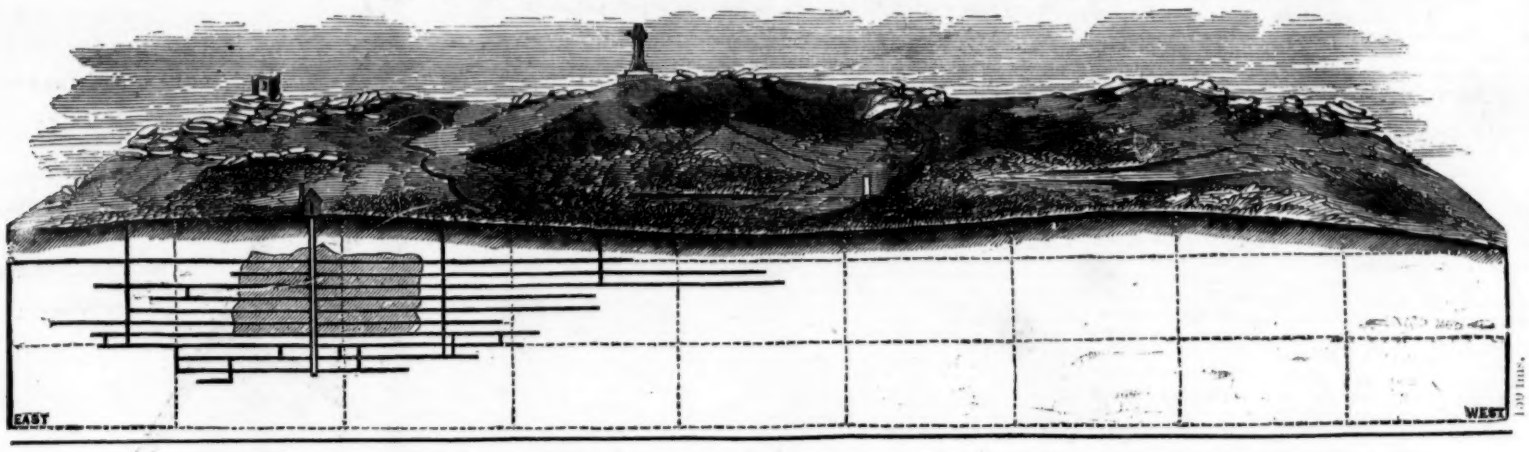


Section of the Workings on Engine Lode.



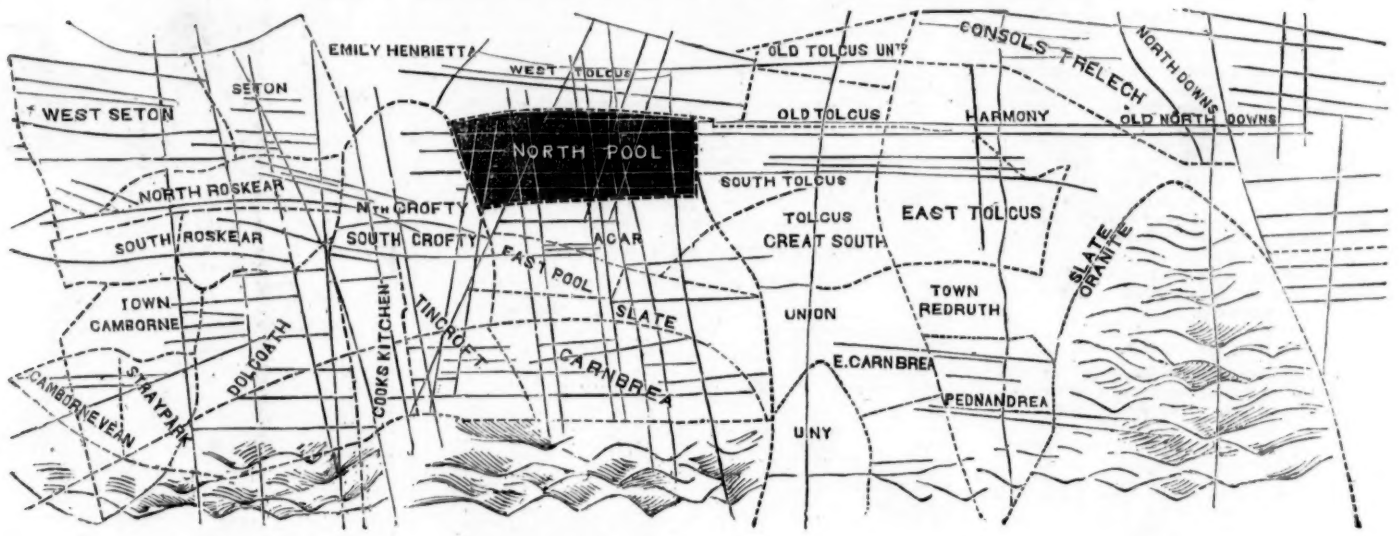
A Geological Map and Section, showing the three Granite Hills which encompass the District, with the Porphyry Dykes, &c., traversing the Clay Slate Band, and the Dip of the Shoots of Ore; also a Plan showing the Workings on the North, Middle, and South Lodes, and the Tin Bounds, copied from the Original in the Museum of Practical Geology, may be seen at the Office.

A VIEW OF CARN BREA HILL FROM THE NORTH.

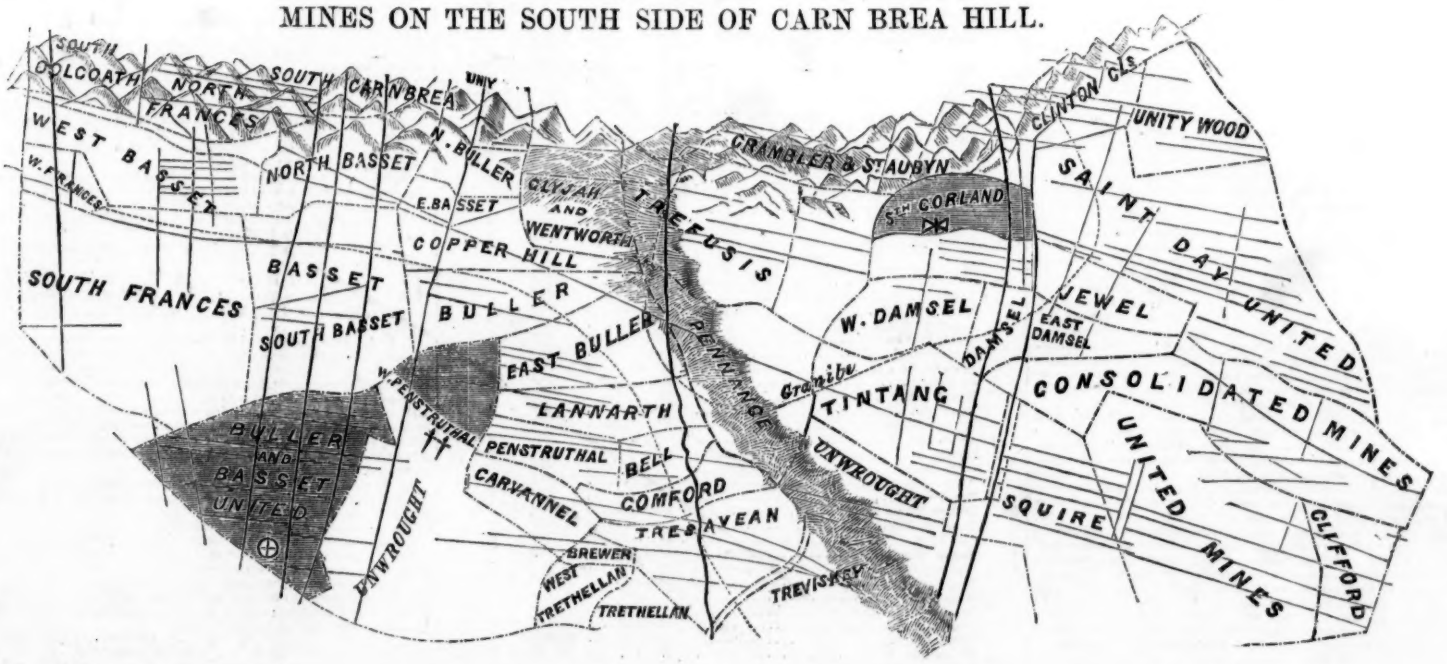


NORTH POOL MINE—THE PRIZE OF 1863, 1864, AND 1865.

MINES ON THE NORTH SIDE OF CARN BREA HILL.



MINES ON THE SOUTH SIDE OF CARN BREA HILL.



BULLER AND BASSET marked +

WEST PENSTRUTHAL marked ††

SOUTH GORLAND marked ⊳⊲

Early application for the remainder of the 32 Shares, at £125 each, is requested by

78, LOMBARD STREET, LONDON,

Stock and Share Broker, and Dealer in British Mining Shares

NORTH POOL MINE.

THIS PROPERTY is situated to the north of the Carn Brea Hill, around which we have the chief copper and tin mines of the past century. In fact, the district given (6 miles by 4) has yielded for the last 70 years, 60 per cent. of all the profits accruing from mining enterprise throughout the counties of Cornwall and Devon.

It is important to observe the position of North Pool mine, which is surrounded by West Tolgus to the north, selling at 100 per cent. premium, and not yet developed; with Old Tolgus, that yielded £1,500,000 copper ore; and South Tolgus, a substantial dividend mine, directly to the east. The piece of unwrought ground (called the Glebe), standing to the west, is ceded to North Pool, with Crofty (£78,000 profits), Seton and West Seton to the West, whilst the surrounding mines are given the profits enumerated in the subjoined table.

In this district are situated the following mines. We collect from published statistics, that they have declared in dividends the large sum of £3,268,046, and at this date command a market value of £1,386,943, upon an aggregate expenditure of £675,812:—

Mines.	Outlay.	Dividends.	Market Value.
Basset	£2,624	£301,824	£43,520
Brewer	1,024	10,600	suspended
Carn Brea	15,000	273,500	65,000
Dolcoath	46,137	245,767	204,060
East Crofty	11,750	78,960	merged
East Pool	3,104	40,000	53,760
North Roskear	13,300	102,000	27,300
Seton	23,166	56,133	65,340
South Frances	9,393	179,676	52,080
Stray Park	26,818	12,500	37,720
Tincroft	54,000	70,050	84,000
Tresavean	3,120	454,422	suspended
Trethellan	1,860	48,441	ditto
Treviskey and Barrier	15,600	37,920	ditto
United Mines	16,000	482,500	merged
North Pool	8,180	61,450	—
Treleigh Consols	30,000	5,500	suspended
Buller	1,280	236,814	14,720
Comfort	19,200	2,422	suspended
Condurrow	8,960	21,760	16,640
North Basset	14,700	84,300	21,750
South Tolgus	4,096	54,784	17,920
Clifford	nil.	40,772	merged
St. Aubyn and Grylls	7,493	896	2,425
West Basset	9,000	139,800	81,000
West Damsel	9,856	11,520	19,200
West Seton	10,000	145,200	100,000
Great South Tolgus	4,350	47,550	36,000
Grambler and St. Aubyn	25,272	11,178	
St. Day United	8,750	3,500	12,000
Cook's Kitchen	41,742	3,367	60,850
East Carn Brea	21,300	—	87,000
East Grenville	8,100	—	13,200
Emily Henrietta	3,584	—	14,848
Grenville	45,900	—	33,000
New Seton	7,900	—	64,000
North Downs	13,000	3,000	23,250
South Carn Brea	38,100	—	16,500
South Seton	12,860	—	7,600
Tolcarne	8,400	—	21,000
Uny	37,581	—	27,648
West Tolgus	13,312	—	26,112
South Goriand	7,000	—	10,000
West Penstruthal	4,600	—	7,500
Total	£675,812	£3,268,046	£1,386,943

The Company is at present divided into 32 shares, which are in course of issue, at £125 each, to complete the purchase of the property. When fully effected, a general meeting of shareholders will be holden; rules and regulations for the conduct of the mine upon the Cost Book system submitted for approval; also the election of a committee of management, appointment of officers and bankers, upon which active operations will be commenced.

NORTH POOL MINE.

For the guidance and information of the Public, it may be satisfactory here to explain that the "Cost-book system" constitutes a complete copartnery between the shareholders as regards the mine or adventure in which they are engaged; it also possesses several peculiar advantages over the Joint Stock Act, and especially when contrasted with banking institutions, wherein liability exists for three years, even after transfer of shares. The salient points of the Cost-book system may be enumerated as follows: Its adaptability to the requirements of mining enterprise, the facility with which it is applied to the settlement of disputes, the ease with which shareholders can escape from future responsibility, the precision with which they can determine their existing liabilities at any moment; and again, the advantages which it affords to the successful development of promising undertakings, through the power possessed of raising from time to time just sufficient money to defray costs incurred, or expenditure required in prosecution. There ought to be no liabilities in mines worked upon the Cost-book system beyond those that accrue over a period of two to four months, so that in fact the copartnery possesses in itself practically every advantage supposed to be afforded by the cumbrous Joint Stock Company's Act.

A Geological Map and Section, showing the three Granite Hills which encompass the District, with the Property Lyders, Middle, and South Lodes, and the Tin Bounds, copied from the Original in the Museum of Practical Geology, may be seen at the Office.

THE INTERNATIONAL EXHIBITION—1862.

The manufacture of Arsenic was formerly confined almost exclusively to Cornwall, but it is now obtained in large quantities from the smelting-works of South Wales. It is obtained in an impure state from the "burning-houses." These are kilns furnished with long flues, in which the metalliferous ores containing arsenic are "roasted," during which operation the sulphur escapes as sulphuric acid, and the arsenic sublimes, and is afterwards condensed. It is swept out of these, and subjected to a process of purification by more careful sublimation. The white arsenic exhibited is an oxide of the metal, the metal itself being of a dark-grey colour. The uses of arsenic are extensive: it is found advantageous when combined with some metals, especially to harden them; it enters into the composition of type-metal, and of shot. It is used in glass manufacture, in small proportions to produce transparency; in larger quantities to produce opalescence in glass. It is also employed in the manufacture of enamels. The arsenical greens, which are mostly arsenides of copper, are employed by paper-stainers and artificial florists, and highly poisonous; but it is to be hoped that ere long their use will be superseded, at least so far as the artificial florists are concerned. Although it had been known to chemists that aniline would yield a green colour with certain oxidising agents, it was left for Dr. Crace-Calvert to discover the means of practically applying it. The process by which the emeraldine is produced consists in printing an acid chloride of aniline on a cotton fabric prepared with chlorate of potash, and in a few hours a beautiful bright green gradually appears, which only requires to be washed. By the use of such a colouring matter, which is also a mineral colour, aniline being produced from coal tar, but quite free from poison, many advantages would result, not the least important being that the appearance of the colour is the same by night as by day.

As specimens of the useful application of mineral products formerly worthless, the Mineral Paints are especially interesting. Messrs. Ellam, Jones, and Co., of Maskeaton Mills, Derby, for example, exhibit oxide of iron paint, made from the ore, expressly for ironwork. This is precisely similar in character to the so-called iron-minium, about which Mr. de Cartier, of Auderghem, in Belgium, has made so much noise, and attempted to infer that there is something marvellous in his paint. Iron paints, although not falsely designated minium in this country, are largely manufactured here, several British manufacturers exhibiting samples of the highest quality: indeed, Wolston's Torbay iron paint is equal to any in the building. The paints are applicable to general purposes, and resist in a remarkable degree the action of the atmosphere, of sulphurous and other gases, and of water. In use it covers well, and as a coating for ships' bottoms, &c., it is very cheap and durable, 62 lbs. of the iron paint covering as much surface as 1 cwt. of either red or white lead, whilst the manufacture is less injurious to health. The Bideford Anthracite Company's mineral black paint has been used in our dockyards and arsenals for the last 40 years, and so long since as 1847 the officials gave the company a certificate to the effect that its superiority is observable in the preservation of wood, iron, and canvas; it covers the wood well, dries quick and hard, is more durable than and does not blister like other blacks, and has a body inferior only to white lead.

THE MINERAL WEALTH OF SPAIN.

The development of the mineral resources of Spain has long been recognised by Englishmen as a channel for the employment of their surplus capital, and, although we are not without instances of imposition having been practised upon our speculators in the sale of Spanish mines, it cannot be doubted that there are many mineral properties in that country which, if properly worked, would be productive of profit both to the mine-owner and the miner. All that is necessary is to remember that it is the same in Spain as elsewhere, "Cada buhonero alaba sus agujas," and that no mining enterprise should be entered upon without first ascertaining that there is at least a prospect of success resulting. The display of mineral and metalliurgical products from Spain is, upon the whole, good, yet the manner in which the collection is arranged, and the difficulty of obtaining necessary information with respect to the exhibits, are not calculated to impress the visitor with any lasting remembrance of the riches represented, or of the collection itself. Copper, lead, and zinc, both ores and in the manufactured state, are exhibited, as well as coal, iron, barytes, and building stones and marbles; but the disorder of the English courts has been so accurately imitated that to learn anything from the display is extremely difficult.

To attempt to arrange our notice of the Spanish minerals according to the class of mineral referred to would be an endless task; we must, therefore, content ourselves with noticing some of the principal exhibitors' contributions in the order in which we meet with them in the official catalogue, which has been so ably prepared by Mr. J. S. Bazan. First, we may mention Mr. Arroys Aznar, of Valencia, who sends calamine ore, from Benahada; sulphate and carbonate of lead, from Sierra de Gados; silver ore, from Sierra Almagrera; and sulphate of antimony, from the district of Oria—all of these are well worthy of attention. Mr. Aztiz also sends some good calamine; and the Royal Asturiana Company show specimens of coals, sheet zinc, and zinc white. Mr. Balbas Castro, of Magallenes, Philippine Isles, has sent copper pyrites and grey sulphides of copper, in quartz and kaolin, as well as native and arsenical copper and antimonial grey copper. Mr. F. Brock, of Linares, exhibits some good argentiferous galena and lead, produced in an English reverberatory furnace; and malleable iron, both in bar and sheet, coal, marbles of a very attractive character, common salt, antimony, blende, barytes, nickel, lignites, and peat are contributed by various persons and from several districts. Mr. Marron sends tin ore from Valladolid; and chromium, mercury, and alum, as well as many of the rarer minerals, are well represented. We have gold dust from Puerto Rico, and the Grand Duchess of Lichtenberg of Russia sends coal, washed and unwashed, and coke, that the minas de Siero y Langreo might not be unrepresented; but the English mine adventurer naturally directs his especial attention to the products from the Rio Tinto and Huelva districts, because he has been more accustomed to hear of them than of any other, and these form precisely the worst displayed portion of the whole collection, and, as the trouble has not been even taken to label the articles in English, comparatively few appreciate the value of the very excellent series for illustrating the cementation process in use in the copper mines, even of the limited number who are bold enough to enter the dirty box-like chamber in which they are placed.

From the Huelva district there are a large number of fine specimens of marble, but, as they are only a few inches square, they are not seen to much advantage. The principal exhibitor of marbles is Don Manuel Castillo, who sends samples from Cantillana, **Moron, Almaden de la Plata, and Estepa. The Guadalquiver Company send some good** pit coals, although the pits are at present suspended, to admit of the erection of two steam-engines. The Pedroso Company exhibit oligistic, magnetic, and hematite iron ore, &c., and cast-iron, sheets, hoops, bars, pins, and steel. Copper ores are shown from the Society of Las Minas Unidas, of the Union del Comercio, from San Fernando Mine, and from Buitron. The collection of pyrites from the Rio Tinto Mines is very interesting, an opportunity being afforded for observing the appearance of ores containing various percentages of copper, from 0·1 to 17. Perhaps the most remarkable fact in connection with these mines is that all ores containing less than 6 per cent. are treated by the cementation process. The result of 1500 assays, made on as many minerals, show that about 8 per cent. of the total of minerals raised contain over 6 per cent. of copper; 12 per cent. are minerals producing between 4 to 6 per. cent.; and 80 per cent. are inferior to 4 per cent. of copper. The poor ores are calcined with brushwood, the calcination lasting from four to six months, the sulphates being then washed and precipitated.

The Minerals of Newfoundland.—Although the minerals from Newfoundland are rather badly placed on the eastern side of the north-eastern transept, and although some doubts might arise as to whether they belong to North America or Ceylon, they are, nevertheless, well worthy of inspection, and leave no doubt that at an early date the mineral resources of the province will form one of its greatest treasures. There are some excellent specimens of copper ore from Trump Island and English Ridge Mines; some good galena from La Manche Mine; silver-lead from Great Lawn Mine; peacock ore from Great Placentia; and yellow copper and mundic from Terra Nova. Nearly the whole of these are exhibited by Mr. F. N. Gisborne, with whose name, in connection with Newfoundland affairs, our readers are already familiar. Messrs. Page, Lash, and Verran have also sent some samples from a lead and silver mine which they are at present working: the specimens comprise quartz rich in silver, and horn silver ore from the Little Lawn Mine. We understand that this so-called Little Lawn is likely to become as valuable a property as any in Placentia Bay, the last advices from Capt. Verran stating that they have already 20 barrels of ore ready for shipment. According to the assays of Mr. W. H. J. Christow, of Truro, it appears that the Little Lawn ores are particularly rich, the vitreous silver giving 84 per cent.; the ruby and brittle ditto, 78½; and the horn silver 76 per cent. The same firm also exhibit some very rich silver-lead ore, but neither this nor the quartz have been assayed.

Brick Making Machinery.—At the extreme end of the western annexe a very simple and effective brick-making machine is exhibited by Messrs. Cazenave and Co., of Paris, the principle being that which in a slightly and immaterially modified form has gained for Messrs. Clayton and Co. such reputation in this country. The machine is not improperly described as a laminoir, or rolling mill, the clay passing from the hopper through the rolls on to an endless bed, upon which the mass of clay is cut to the desired size. The apparatus is equally valuable for working either by hand or steam, and by hand labour alone produces bricks at the rate of 24 per minute, and numerous and continued experiments have proved that with the machine attended by two men and five children 10,000 bricks per day of ten hours can be produced with the greatest ease. The brick is very perfectly formed, and as the pressure given by the machine is regular, and sufficient to admit of a comparatively dry clay being used, the resulting brick is compact, dries quickly, and is more easily burned. The manufacturers have received a certificate from the head engineer of the Toulouse and Tarbes Railway relative to the performance of the machine, which was even more satisfactory than stated above—"Three men and five children (who received together 11 frs. per day wages) moulded in the day of ten hours 12,780 bricks, of the Burgundy or usual Paris shape, the price of moulding being, consequently, only 86 centimes per 1000." During the experiments the machine worked well, and the engineers who witnessed them report that they could see nothing at all likely to get out of order. Perhaps the most ingenious part of the machine is that for cutting the plate of clay into the bricks. The clay passing through the rolls is of the width of two bricks, and is first divided longitudinally by a vertical wire, the transverse cuts being made by a series of wires on a wheel which revolves at such a speed that the cutting wire shall pass exactly vertically through the clay.

Slow-Combustion Boiler.—In the hardware department, an excellent and very economic boiler for warming and ventilating purposes is exhibited by Mr. Riddell, of Cheapside. By its use a warm and healthy atmosphere may be obtained without the slightest trouble or danger, and from an apparatus which may be made to take the form of an attractive work of art. From the ingenious manner in which Riddell's slow-combustion boiler is constructed there is always an ample supply of boiling water for domestic or general purposes, whilst the consumption of fuel is reduced to the minimum, no more heat being generated than is absolutely required, and sufficient heat may be obtained for warming a conservatory or hot-house. The improved boiler consists of two wrought-iron cylinders of different diameters, placed one within the other in a vertical position. These are carefully welded together at each end, and rest upon a solid bed of fire-brick. The interior of the smaller cylinder forms the fire-chamber for containing the burning fuel, while the cavity between the inner and the outer cylinder is the water space of the boiler. The whole is contained in an iron case, between which and the external surface of the outer cylinder a space is left, which forms the flue for conducting the heated air and products of combustion to the chimney. This flue is so constructed that the whole outer surface of the boiler must be brought into contact with the heated products of combustion on their passage to the vent, and the effect produced is the same as if the boiler were plunged into a mass of burning fuel. The air required for supporting combustion is admitted by a regulating door or slide attached to the base of the boiler, while the fuel is supplied through a cone on the top, both of which—viz., the slide and the cone can, if required, be closed nearly air-tight. The consequence of this arrangement is, that the supply of atmospheric air can be regulated to the greatest nicety. The boiler is extremely simple, and requires very little attention; indeed, none which could not be conveniently given by a lady herself. The prices are such as cannot fail to ensure the adoption of these boilers; and as they are made in small sizes, so as to be suitable for heating sufficient water for a single bath, it will be apparent that they are worthy of a place in almost every house.

"Mon-Moor" Iron.—In the hardware department, near the large safe exhibited by Mr. G. Price, is a very interesting case exhibited by Messrs. Wright and North, of the Mon-Moor and Cleveland Iron and Steel Works, Wolverhampton. The metal shown appears to be of first-rate quality, and in use this opinion has been well borne out. The specimens principally consist of samples of Stocker's combined metal wheel tyre and horse-shoe bars, for the manufacture of which this firm are the sole licensees. The combined metal tyre and shoe bars are found to possess great tenacity and durability, and to be very economic in use. It has been proved by experience that tyres made from these bars will not only endure much longer than those made from ordinary bars, but they will not stretch and become loose on the wheel, as ordinary tyres do. The important advantages of this tenacious quality are, that not only is the expense of removing stretched tyres avoided, but the wheels are firmly held together to the last, and their duration proportionably increased. The patent combined metal has been thoroughly tested, in London and Manchester, upon omnibuses, cabs, and various other vehicles, doing heavy and severe work, and in no instance has it been known to fail in any respect. In rough and heavy work their superiority is so great as to render them indispensible to those who have once used them; nor are their advantages less apparent where extreme lightness is required. Their tensile strength, or capacity to resist stretching and tearing asunder, is 50 per cent. greater than that of the best iron tyre bars. Messrs. Wright and North are also celebrated for the excellent quality of the boiler-plates, sheets, hoops, bar-iron, and spring steel which they manufacture; and, considering the manner in which the awards of the Jurors were made, can well afford to have been passed by unnoticed by them.

SALES OF LEAD ORES.

LEAD ORES SOLD FOR THE QUARTER ENDING SEPTEMBER, 1862.

Mines.	Tons.	Amount.
Minera	1720	£22,140 1 0
Dyliffe	502	7,037 17 6
Frongoch	500	6,017 5 0
Talargoch	388	5,335 10 9
Rhosesmor	399	5,220 12 6
Ladcott (including 34 tons silver)	142	4,574 10 0
Cargoll	309	4,531 2 8
Isle of Man	225	3,876 5 0
East Darren	230	3,472 0 0
Laxey	200	3,450 0 0
Wheal Mary Ann	135	3,323 17 0
Trelawny	188¾	3,106 6 0
Wheal Frank Mills	210	3,089 10 0
Cwmystwith	200	2,492 10 0
Cwm Erfin	158	2,417 8 0
Herodsfoot	82	2,326 15 0
Foxdale	100	2,262 10 0
South Exmouth	168	2,052 18 0
Glogfach	120	1,840 10 0
East Logylas	140	1,768 0 0
Bryn Gwiog	122	1,613 2 0
West Chiverton	110	1,497 0 0
Cefn Brwyno	109	1,377 16 0
Maesysafn	100	1,295 0 0
Parry's	92	1,234 1 6
Chiverton	65	1,131 4 0
Bronfloyd	80	1,050 0 0
Dyfngwm	73	923 16 0
Llanerchymaur	62	863 5 0
Roman Gravels	62	797 15 3
Newtownards	60	766 10 0
Llangynog United	60	754 6 0
Long Rake	55	707 12 6
Westminster	55	652 7 6
Goginan	38	632 19 0
Hendre Ucha	45	580 12 6
Mill Dam	47	531 16 0
Castleward United	40	494 0 0
North Carrock	45½	423 18 0
Holmbush	23¾	386 19 0
Mount Pleasant	31	378 5 0
Llanwrst	30	360 0 0
Cae-Conroy	24½	340 15 0
South Darren	17¼	308 11 7
Cwmbrane	24½	298 18 0
Deep Level	24	291 8 0
Glogfaur	23	287 10 0
North Laxey	20	260 0 0
Pennant	20	259 0 0
Brynford Hall	19	228 17 0
Aberdovey	18½	227 11 0
Orsedd	16½	219 1 0
Clara United	18	216 18 0
Alt-y-Crib	16½	211 4 9
Pool Park	15	190 5 6
Minera Union	14	175 7 6
Holywell Level	10	144 5 0
Chwarelau	10	130 15 0
North Henblas	10½	128 16 3
Pant-y-Buarth	10	125 10 0
Nanteos United	11½	123 8 4
Nant-y-Iago	10	123 5 0
Bryn Gwyn	9	117 0 0
West Merilyn	9	116 2 6
Grosvesnor	8	102 8 0
Rhoswydol	8	96 16 0
Herward United	7½	87 11 3
Lower Park	7	86 19 6
Merilyn	7	85 6 3
Harwood	7	83 2 6
Cefn Cilcen	6	77 11 0
Trelogan	5	60 7 6
Pwll Bramwell	4½	59 3 6
Cardigan Consols	4½	58 3 9
North Porthilly	4¼	49 11 0
Rhiwarth	3½	49 10 0
Ty Mawr		39 1 8
Llanfyrnach	64	—

BLENDE.

Minera	105	£ 281 3 0

SALES OF BLACK TIN.

BLACK TIN SOLD FOR THE QUARTER ENDING SEPTEMBER, 1862.

Carn Brea	139	£ 7,968 1 9
St. Day United	98¾	5,638 0 8
Wheal Gryills	75	4,794 0 0
Great Wheal Vor	67½	4,547 19 9
Drake Walls	63¾	4,308 3 9
Fowey Consols	48	3,035 5 2
Boscaswell	49¾	3,016 10 8
Great Wheal Fortune	39¾	2,716 17 9
Boscean	40¼	2,712 0 6
Great Wheal Busy	41¾	2,364 1 10
Carnyorth	33	1,998 2 0
Par Consols	26¼	1,614 16 11
Great Work	22½	1,582 17 6
Gurlyn	24	1,505 9 0
South Carn Brea	23	1,451 7 6
Wheal Buller	22¾	1,427 0 0
Wheal Kitty	15¾	1,343 3 1
Trevenen and Tremenheere	14¾	937 3 6
Bottle Hill	13½	848 1 1
North Wheal Jane	12¼	780 14 11
Penhalls	11	690 1 6
Wheal Prospidnick	8¼	504 1 5
Furze Hill Wood	6¾	448 3 11
St. Just United	6½	407 1 0
Cuddra	5½	362 16 10
West Par Consols	5½	309 14 11
Redmoor (with 18 tons scot=31l. 10s.)	3¾	282 8 10
Leeds and St. Aubyn	4½	273 0 0
North Basset	4	248 6 10
Wheal Union	2	125 14 0
Wheal Vyvyan	1¼	68 18 0
East Birch Tor	1	63 2 3

PATON'S PATENT MINERAL BORING AND WINDING MACHINE.

MANUFACTURED BY

WILLIAM DIXON,

GOVAN BAR IRONWORKS,

GLASGOW.

AGENTS IN LONDON,

CAMPBELL BROTHERS,

CALDER AND GOVAN IRON WHARF,

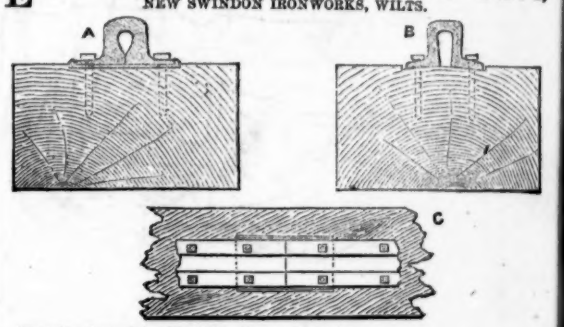
WILLIAM STREET

BLACKFRIARS.

A NUMBER of these BORING MACHINES are at PRESENT WORKING in the neighbourhood of GLASGOW, at LESS THAN HALF THE USUAL COST for boring and with THREE TIMES THE SPEED.

ELLIS'S PATENT BRIDGE RAIL,

NEW SWINDON IRONWORKS, WILTS.



The advantages claimed by this rail over others are:—

1.—Its having a flat or solid surface its whole breadth to bolt down to the timbers (see section A).

2.—The impossibility of its collapsing, as is the case with all other bridge rails (see section B).

3.—Its being perfectly rigid. The bolts, therefore, remain firm in the timber till the rail is quite worn out.

4.—Its effecting a saving in the timbers of from 50 to 100 per cent., as there is no liability of the timbers being torn and splintered by their shifting, as is shown in section B, where the heads of the bolts are frequently torn off.

5.—Its shape admits of its being rolled at a less weight to the yard, without diminishing its strength or durability.

This rail has been submitted to several of the principal engineers and practical men of the day, who have pronounced it the best that has been produced. It carries the palm for lightness, durability, and consequently cheapness.

The patent rail at 62 lbs. per yard is sufficiently strong to carry the heaviest engine on the Great Western Railway.

THOMAS ELLIS, NEW SWINDON IRONWORKS, WILTS.

BASTIER'S PATENT CHAIN PUMP,

APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. Bastier begs to call the attention of proprietors of mines, engineers, architects, armers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine as daily demonstrated by use:—

1.—It utilises from 90 to 92 per cent. of the motive power.

2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.

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